



## ITRI 625

*Pfleeger Chapter 13*



# Making a business case

- Various internal and external pressures drive organizations to scrutinize the amount and effectiveness of their cyber security practices and products.
- Any evaluation of an existing or proposed investment in technology should be reported in several ways at once to form a "balanced scorecard".
  - From a customer view, addressing issues such as customer satisfaction
  - From an operational view, looking at organizational core competencies
  - From a financial view, measures such as ROI or share price
  - From an improvement view, how the investment will affect market leadership and added value

# Determining economic value

- Economic value can be a unifying principle in considering any business opportunity. There are many different ways to capture it, including:
  1. Net present value. The present value of the benefits minus the value of the initial investment.
  2. Internal rate of return. Derived from the NPV and is equal to the discount rate that makes the NPV equal to zero.
  3. Return on investment. Generated by dividing the last period's accounting profits by the cost of the investments required to generate those profits.
- In general, businesses need to know whether and how investing one more unit buys them more security.

# Modeling cyber security

- Cyber security economics brings together elements of cyber security and economics to help decision makers to invest already constrained resources.
- Among the many questions asked about cyber security investments are:
  1. How much should an organization invest in cyber security to protect assets of a given value? Can be addressed by applying accounting techniques to develop a model of information protection.
  2. What is the likely impact of a security breach? Can be addressed by examining the economic effect of information security breaches reported in newspapers and publicly traded corporations.
  3. What are the costs and benefits of sharing information? Addressed using game theory. Two competing organizations are pitted against each other to obtain models of cost and demand.

# Modeling cyber security *cont.*

- When presented with information about risk in terms of probability and payoff, researchers have found that:
  1. When the payoff is small, people focus on the risk.
  2. When the risk is small, people focus on the payoff.
- Many cyber security risks have a very small likelihood of occurrence but can have an enormous impact in terms of cost, schedule, inconvenience, or even human life.
- Group behavior dynamics has also been widely researched, and it has been documented how group dynamics can influence decision-making. It extends beyond teams to affect clients, colleagues and even competitors.

# The role of organizational culture

- Trust and interpersonal relations are solidly linked to economic behavior. The typical dimensions of organizational culture are:

Pole 1	Pole 2	Explanation
Process oriented	Results oriented	Means vs. goals
Employee oriented	Job oriented	Concern for people vs. completing job
Parochial	Professional	Identity from organization vs. profession
Open system	Closed system	With respect to newcomers
Loose control	Tight control	With respect to employee autonomy
Normative	Pragmatic	Rule-based vs. job-driven

# The role of organizational culture *cont.*

- Organizations seldom fall into a specific dimension, and tend to lie somewhere in the middle, between dimensions.
- These dimensions affect an organization's cyber security economics.
- The organizational culture reflects the underlying organizational values and therefore suggests the kinds of choices likely for cyber security investment behavior. For example:
  - A results-driven organization may choose to invest in penetrate-and-patch behavior rather than in best-practice training.
  - A professional organization may certify all its security professionals, but a parochial one may prefer to invest instead in rewarding those developers whose products have the fewest security failures after release.

# Questions

- Any Questions?